

REMARKS

A petition for a three month extension of time has today been filed as a separate paper and a copy is attached hereto.

The rejection of claims 1-6 and 12 for obviousness over the combination of Shober '484 in view of Kusafuka '195 and the rejection of claims 7-9 for obviousness further in view of Thorum '202 are respectfully traversed for several reasons. Firstly, the combination of Shober and Kusafuka is considered improper because the motor control methods of Shober and Kusafuka are very different. Shober utilizes a potentiometer which measures resistance of a section of strip 155 between a bridging assembly 160 connected to a slidable element 90 and the terminus of the strip 155a. As taught at column 7, lines 57-61 of Shober, different potentiometer values are assigned to the various transmission positions or ranges and stored in memory for use later in shifting. Thus, when a potentiometer detects a specific value corresponding to a given transmission range, DC motor 55 is stopped at once. In contradistinction, Kusafuka et al employs a position sensor 28 which detects positions of the detent grooves as described at column 6, lines 3-7, and signals from the position sensor 28 serve to stop the motor 12 as described in paragraph [0032] at column 7 of Kusafuka.

In the present invention, as described in paragraphs [0099] and [0100] of applicants' specification, precise motor control as in Shober is not required because the detent mechanism serves to precisely position the relevant range groove on the detent lever 40. In the present invention the detent mechanism and the ball nut have two functions relating to the running range switching device. More specifically, in the present invention not only is the ball nut 22 movable in the axial direction by the rotation of the ball screw shaft 23, but also, in the reverse direction, the ball screw shaft 21 can be rotated with "relative ease" by axial movement of the ball nut 22. (Page 19, paragraph [0087]) as the first function. Here, "relative ease" means as easily as the ball screw shaft 21 is rotated by operation of the detent mechanism 9. (Page 19, paragraph [0087]). In other words, the ball nut 22 can drive the motor 4 (first function). In the second function the motor 4 is rotated by the first control unit 3, and the motor 4 is stopped by the first

control unit 3 when the output voltage of the position sensor 8 reaches a predetermined value. When the motor 4 is stopped, the detent lever 40 is rotated by the urging force of the roller 42 that is generated by the elastic force of the detent spring 41. As a result, the roller 42 is lodged within the range groove of the detent lever 40 and is precisely positioned therein and holds that position corresponding to the predetermined range position (P. 24, paragraph [0098]- P.25, paragraph [0100]). In other words, by the second function the running range switching device is switched to the predetermined range position by the detent mechanism without precise control of the motor 4.

Further, the examiner has not stated a rationale for any motivation which would have led to combining structures of the two references in the manner of the hypothetical combination. At page 3 of the office action the examiner writes:

“It would have been obvious to [sic] of ordinary skill in the art at the time of the invention to modify Shober to employ the range switching member [2?] in view of Kusafuka in order to provide a means for the range switching shaft [40 of Shober?] to control the automatic transmission.”

The statement quoted above is not understood. It should be noted that the manual valve 2 of Kusafuka has linear motion whereas the shaft 40 of Shober rotates.

Finally, even if it were obvious to combine the references in the manner suggested by the examiner, the result would not be the invention as defined by the amended claims. For example, none of Shober, Kusafuka and Thorum discloses or suggests a conversion mechanism in the form of a ball screw including a ball screw shaft, a ball nut and balls interposed therebetween. It follows that the references, neither alone nor in combination, disclose or suggest an intermediate mechanism which is engaged with and pivots with linear motion of a ball nut. Thorum’202 apparently is cited merely for its disclosure of a “transmission case member 12”, perhaps relevant to claim 7. Note that the limitations of claim 9 have now been incorporated into claim 1. In rejecting claim 9, at page 5 of the office action, the examiner characterizes Shober as disclosing a “ball screw shaft 80”, a “ball nut 85” and “balls”, the latter allegedly shown in Fig. 3 of Shober. While Fig.3 is unclear, the relevant structure shown there is described in terms other than a ball screw mechanism. At column 4, lines 40-44, Shober characterizes Figs. 3 and 4 as showing a

screw drive with "threaded engagement" between "internally threaded output sleeve 85" and "externally threaded actuator shaft 80".

In conclusion, it is respectfully requested that the examiner reconsider the rejection of record with a view toward allowance of the claims as amended.

Respectfully submitted,
BACON & THOMAS, PLLC

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By:  George A. Loud
Registration No. 25,814

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BACON & THOMAS, PLLC
625 Slaters Lane, 4th Floor
Alexandria, Virginia 22314
Telephone: (703) 683-0500